

Claims:

1. Process for the polymerisation or copolymerisation in the gas phase of ethylene by bringing the said ethylene into contact, under polymerization or copolymerisation conditions in a reactor in which the start-up bed is fluidised and/or agitated with mechanical stirring, with a catalyst system, which process comprises a pre start-up operation characterized in that, prior to the introduction of the catalytic system in the reactor, it comprises the following steps

1. determining the density d and melt index MI of the polyethylene powder to be produced at start-up,
2. heating the start-up bed by controlling the temperature inside the reactor such that
 - a. the temperature is maintained at least 0.5°C below the sintering temperature of the start-up bed, and
 - b. the temperature is maintained at a value equal or higher than the one corresponding to a RTSE value of 4.4 for the d and MI values of the polyethylene powder to be produced.

2. Continuous gas fluidized bed process for the polymerization of ethylene monomer and one or more optional alpha-olefins, in a fluidized bed reactor by continuously recycling a gaseous stream comprising at least some of the ethylene through the fluidized bed, comprising the steps of

1. having and/or introducing a seed bed into the reactor,
2. some or all of the recycling gas acting as the fluidizing gas through the bed in order to maintain the bed in the fluidized state,
3. heating the fluidizing gas with an external heating system,

4. determining the density d and melt index MI of the polyethylene powder to be produced at start-up
5. identifying in the RTSE tables the temperature corresponding to a RTSE value of 4.4 for the polyethylene powder to be produced at start-up,
- 5 6. having and/or building into the reactor the appropriate reactive olefin gas and/or liquid environment, and
7. a final step of introducing into the reactor the active polymerization catalyst specie which instantaneously starts the olefin polymerization process, characterized in that, before the final step of introducing the catalyst into the reactor, the
- 10 heating step is conducted by controlling the temperature inside the reactor such that
 - a. the temperature is maintained at least 0.5°C below the sintering temperature of the start-up bed, and
 - b. the temperature is maintained at a value equal or higher than the one identified in above step 5 (i.e. the temperature corresponding to a RTSE
 - 15 value of 4.4 for the d and MI values of the polyethylene powder to be produced).
3. Process according to claim 1 or 2 wherein the heating step of the start-up bed by controlling the temperature inside the reactor is also such that the temperature is maintained at a value equal or lower than the one corresponding to a RTSE value of 4.2
- 20 for the d and MI values of the polyethylene powder to be produced.
4. Process according to any of the preceding claims wherein the polymer grade to be produced at start-up requires a heating temperature of at least 95°C , preferably at least 100°C according to its corresponding 4.2 RTSE value in the tables.

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